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The Literature of Arthropods Associated with Soybeans

IV. A BIBLIOGRAPHY OF THE

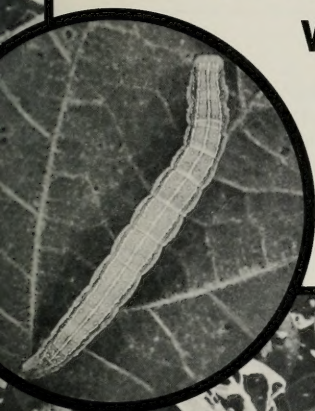
VELVETBEAN CATERPILLAR

*Anticarsia gemmatilis* Hübner

(Lepidoptera: Noctuidae)

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# The Literature of Arthropods Associated with Soybeans

## IV. A BIBLIOGRAPHY OF THE VELVETBEAN CATERPILLAR

*Anticarsia gemmatilis* Hübner (Lepidoptera: Noctuidae)

B. J. Ford, J. R. Strayer, J. Reid, and G. L. Godfrey

*Anticarsia gemmatilis* Hübner (1816) (Lepidoptera, Noctuidae) is an insect that has become a major concern to persons involved in the production of soybeans (*Glycine max* (L.) Merrill) in the Western Hemisphere. The larva of this species is commonly called the velvetbean caterpillar by researchers in the U.S.A. because it so seriously defoliated the velvetbean (*Stizolobium deeringianum* Bort) in the early 1900's (Chittenden 1905). Velvetbean caterpillar is now the common name for *A. gemmatilis* accepted by the Entomological Society of America.<sup>1</sup> Agricultural researchers in Mexico use a close Spanish equivalent for the common name, *gusano terciopelo*,<sup>2</sup> and Brazilian entomologists frequently refer to the species as *lagarta da soja*.

Until recently, the specific name was erroneously spelled "*gemmatilis*" by many authors. The error apparently traces back to Smith's (1893) misspelling. There are several synonyms in the literature partly because the maculation and coloration of the adults are extremely variable. Persons interested in the synonyms should consult Druce (1900) and Schaus (1940).

*A. gemmatilis* is primarily a foliage feeder on the Leguminosae. Guyton (1940) and English (1946) both described outbreaks of the caterpillars damaging peanuts (*Arachis hypogaea* L.) in Alabama. For Puerto Rico, Wolcott (1923, 1933, 1936, 1948, 1955) referred to the association of *A. gemmatilis* with soybean, peanut, alfalfa (*Medicago sativa* L.), sword bean (*Canavalia gladiata* DC.), bush bean (*Phaseolus vulgaris* var. *humilis* Alef.), lima bean (*P. limensis* Macf.), cowpea (*Vigna sinensis* Savi), and the gallito tree or Australian cork-wood tree (*Agati grandiflora* Desv.). Telford & Childers (1947) studied *A. gemmatilis* in relation to tropical kudzu (*Pueraria phaseo-*

*lodes* (Roxb.) Benth.) and kudzu (*P. lobata* (Willd.) Ohwi). Hinds & Osterberger (1931) reported cotton (*Gossypium*) as a host, but this seems to be the only nonleguminous host recorded for *A. gemmatilis* in the United States. Wheat (*Triticum*) was reported to be damaged by the species in Peru (Wille 1939).

Because the acreage and economic value of soybeans has increased substantially in subtropical and tropical areas during the last decade, it is not surprising that the species is now recognized as a major soybean pest. Outbreaks of the species on soybeans extend beyond the subtropics as far north as Maryland, Delaware, and Tennessee, U.S.A. These records were obtained from the U.S. Department of Agriculture Cooperative Economic Insect Report, Volumes 1-23 for 1951-1973. Soybean defoliation caused by *A. gemmatilis* in the U.S.A. is most serious in the southeastern and Gulf Coast states. The velvetbean caterpillar was first reported as a soybean pest in Florida and South Carolina by Nickels (1926). He estimated that in 1925 losses in South Carolina exceeded \$500,000. Douglas (1930) reported the same insect defoliating soybeans in Texas. Hinds & Osterberger (1931) reported the velvetbean caterpillar as a pest in Louisiana, but did not believe it to be a limiting factor in soybean production. Strayer (1973) determined that soybean defoliation by *A. gemmatilis* was limiting production in Florida and reported the estimated cost of control was \$1.2 million yearly from 1970 to 1973.

A detailed life history of *A. gemmatilis* was published by Watson (1916). Greene, et al. (1973) have further observed feeding of the caterpillar, and mating and oviposition of the moths. Eggs are most often laid singly. There are six to seven larval instars during the normal 3- to 4-week developmental period. The larva consumes 98 percent of its total food during the third through the last stage.

*A. gemmatilis* is regarded as a tropical to subtropical species. Apparently it does not overwinter in temperate regions. It is presently believed that the species survives winter no farther north than central Florida in the U.S.A. except during very mild winters and that economic outbreaks of the pest are primarily limited to Florida and neighboring states in late summer. However, as stated above, areas farther north have experienced outbreaks. Moths have been reported as far north in North America as Ontario, Canada (Watson 1916) and Wisconsin (Smith 1893). The

1. Entomological Society of America, Committee on Common Names of Insects. 1970. C. C. Blickenstaff, chairman. Common names of insects approved by the Entomological Society of America. [Published by the Entomological Society of America.] 36 p.

2. Peña-M, R. and J. A. Sifuentes. 1972. Lista de nombres científicos y comunes de plagas agrícolas en México, 1972. Agricultura Técnica en México 3: 132-144.

This paper is published by authority of the State of Illinois, IRS Ch. 127, Par. 58.12. B. J. Ford is a Research Assistant at the Illinois Natural History Survey. Dr. J. R. Strayer is an Associate Professor, and J. Reid is a Graduate Assistant, in the Department of Entomology and Nematology, University of Florida. Dr. G. L. Godfrey is an Assistant Professor and International Programs Coordinator of Agricultural Entomology, University of Illinois, and an Assistant Entomologist at the Illinois Natural History Survey.

western distributional limits in North America are not clearly documented. According to Pacheco (1970), velvetbean caterpillars occur in Valle del Yaqui, Sonora, Mexico. Dr. J. G. Franclemont, Cornell University, collected the moths of *A. gemmatilis* in Madera Canyon, Santa Rita Mountains in southern Arizona (personal communication to G. L. Godfrey). The species is widespread in South America and the West Indies. There are soybean association records as far south as the Argentine provinces of Corrientes and Misiones (Rizzo 1972), Cordoba, and Tucuman, with occasional records near the city of Buenos Aires (Rizzo, personal communication to G. L. Godfrey).

This bibliography on *A. gemmatilis* is the fourth in a series contributing to the knowledge of the biology and control of arthropods on soybeans to assist in improved protection and production of this crop. The philosophy and scope of this bibliography is similar to that in the preceding bibliographies of the series. The references are not solely restricted to *A. gemmatilis* on soybeans. Many of the listed references pertain to the occurrence of *A. gemmatilis* on other leguminous crops, and to control measures, laboratory investigations, and systematics.

The titles in the present list were obtained primarily from standard reference sources and cross references. The literature search was concluded on December 31, 1973. The bibliography is as complete as possible with no deliberate screening except as noted below. References to reports in the USDA *Cooperative Economic Insect Report*, USDA *Insect Pest Survey Bulletin*, and Canadian *Insect Pest Review* were

not included because their indexes are very complete. Interested researchers are urged to consult them for additional information. A few references have not been specifically searched, due to the inability of the authors to locate them. They are designated with the symbol #.

The references are listed alphabetically by author, numbered consecutively, and tabulated by subject and period of publication (see reference table following the numbered entries), a decade being the smallest period considered. A reference can appear more than once in the subject index. This procedure was adopted to make cross referencing for the index as complete as possible.

Title abbreviations of the periodicals cited in this publication are listed along with spelled-out titles at the end of the paper.

SIRIC (Soybean Insect Research and Information Center, Illinois Natural History Survey and University of Illinois at Urbana-Champaign) has developed a series of computer programs which make possible more detailed searches of the literature according to subject matter. All citations in this bibliography are stored on tape, and can be retrieved through a series of key words which define categories considerably more refined than those listed in the table which follows the numbered references. The computerized information system greatly increases the usefulness of the printed bibliographies, and the two together are an important part of the effort of the Illinois Soybean Entomology Team to search out, compile, and organize for ready access the ever-increasing information on soybean entomology for the benefit of all professionals working in this area.

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## BIBLIOGRAPHY

1. ANONYMOUS. 1911/1912. Provision crops. Monserrat Bot. Sta. Rep. 1911/1912:8-14. illus.
2. ———. 1911/1912. Work connected with insect and fungus pests and their control. Monserrat Bot. Sta. Rep. 1911/1912:16.
3. ———. 1915. Pea and bean weevils. Agr. News (Barbados) 14(340):154. illus.
4. ———. 1917. Insect pests in the West Indies in 1916. Agr. News (Barbados) 16(392):138-139.
5. ———. 1927. Factors determining northern limits of *Anticarsia gemmatilis*. Fla. Entomol. 11(1):10-12.
6. ———. 1928. The velvet bean caterpillar, a peanut pest in the Everglades. Fla. Entomol. 12(3):39-40.
7. ———. 1929. Caterpillars damaging soy bean field in Louisiana. Bur. Farmer 5(1):21.
8. ———. 1946. The control of velvetbean caterpillar. Ga. Coastal Plain Exp. Sta. Mimeo. Pap. 472 p.
9. ———. 1947. Root crops and legumes in the Caribbean. Caribbean Res. Coun. Crop Inq. Ser. 128 p. illus. refs. maps.
10. ———. 1952. Beans have pests like other crops. Soybean Dig. 12(10):26.
11. ———. 1953. You can control all known pests by starting in time. Soybean Dig. 13(9):10-11. illus. refs.

12. ———. 1955. Control soybean insects. Va. Polytech. Inst. Agr. Ext. Serv. Circ. 648. 4 p. illus.
- #13. ———. 1956. Lagarta da soja. [Soybean caterpillar.] Agr. Pecuar. 389:56.
14. ———. 1957. Insect pests of soybeans and their control. Soybean Dig. 17(10):16-18, 20. illus. refs.
15. ———. 1960. Control of insect pests. Soybean Dig. 20(8):14-16. illus.
16. ———. 1960. These are some pests that damage soybeans. Soybean Dig. 20(8):16-19. illus. refs.
17. ———. 1961. Corn earworm was important pest in 1960. Soybean Dig. 21(7):16. illus. maps.
18. ALLEN, G. E., G. L. GREENE, and W. H. WHITCOMB. 1971. An epizootic of *Spicaria rileyi* on the velvetbean caterpillar, *Anticarsia gemmatilis*, in Florida. Fla. Entomol. 54(2):189-191. illus. refs.
19. ALLEN, W. A., M. L. BOBB, J. M. GRAYSON, J. E. ROBERTS, SR., W. H. ROBINSON, and J. A. WEIDHAAS. 1972. 1972 Virginia insect control guide. Va. Polytech. Inst. Ext. Div. Contr. Ser. 141. 118 p. illus. maps.
20. ANNAND, P. N. 1944/1945. Cereal and forage crop pests. U.S. Dep. Agr. Rep. Chf. Bur. Entomol. Plant Quar. 1945: 31-32.
21. ———. 1946/1947. Surveys help reduce losses from velvetbean caterpillar. U.S. Dep. Agr. Rep. Chf. Bur. Entomol. Plant Quar. 1947:32-33.
22. ARANT, F. S. 1939. The relative efficiency of rotenone containing insecticides in the control of vegetable insects. Ala. Agr. Exp. Sta. Annu. Rep. 50:39-41. illus.
23. ———. 1942. Relative effectiveness of several rotenone-containing insecticides against various insects. J. Econ. Entomol. 35(6):873-878. illus. refs.
24. ———. 1945/1946. Velvetbean caterpillar and other peanut insects. Ala. Agr. Exp. Sta. Annu. Rep. 56/57:34-35.
25. ———. 1947/1948. Control of peanut insects. Ala. Agr. Exp. Sta. Annu. Rep. 58/59:43-44.
26. ———. 1948. Preliminary field tests with new insecticides for control of velvetbean caterpillar. J. Econ. Entomol. 41(5):803. illus. refs.
27. ———. 1948. Status of velvetbean caterpillar control in Alabama. J. Econ. Entomol. 41(1):26-30. illus. refs.
28. ———. 1951. Insect pests. In: The peanut — the unpredictable legume. A symposium. The National Fertilizer Association, Washington, D.C. p. 210-261. illus. refs.
29. BALLOU, H. A. 1912. Insect pests of the Lesser Antilles. West Indies Insep. Dep. Agr. Pamph. Ser. 71. 210 p. illus.
30. ———. 1913. Notes on insect pests in Antigua. Bull. Entomol. Res. 4(1): 61-65. illus.
31. ———. 1916. Report on the prevalence of some pests and diseases in the West Indies during 1915. West Indian Bull. 16(1):1-30. illus.
32. BARBER, G. W. 1936. Efficiency of *Trichogramma minutum* Riley in relation to population density of its host. J. Econ. Entomol. 29(3):631.
33. BARNES, W., and J. McDUNNOUGH. 1917. Check list of the Lepidoptera of Boreal America. Herald Press, Decatur, Ill. 392 p.
34. BARNHART, F. 1954. Soybean insects and their control. In: Soybeans. Floyd Barnhart, Caruthersville, Mo. p. 171-196. illus. refs.
35. BARNS, H. P., and F. V. RAND. 1937. Plant pests and diseases. In: Report on the agricultural experiment stations, 1937. U.S. Dep. Agr. Off. Exp. Stas. Rep. 1937:62-102.
36. BASTOS CRUZ, B. P., M. BARRETO FRIGUEIREDO, and E. ALMEIDA. 1962. Principais doenças e pragas do amendoim no Estado de São Paulo. [Principal diseases and pests of groundnut in the state of São Paulo.] Biológico 28(7):189-195. illus.
37. BAVER, L. D. 1945/1946. Soybean caterpillars stopped by DDT and benzene hexachloride dusts. N. C. Agr. Exp. Sta. Annu. Rep. 69:55-56.
38. BEATTIE, J. H., F. W. POOS, and B. B. HIGGINS. 1954. Growing peanuts. U.S. Dep. Agr. Farmers Bull. 2063. 54 p. illus. maps.
39. BEGUM, A., and W. G. EDEN. 1963. When to treat soybeans for worm control. Highlights Agr. Res. 10(2):6. illus.
40. ———, and ———. 1965. Influence of defoliation on yield and quality of soybeans. J. Econ. Entomol. 58(3):591-592. illus. refs.
41. BIEZANKO, C. M. 1958. Algumas noções sobre a soja e seu cultivo. Utilidades da soja. [Some notions about soybeans and their cultivation. Usefulness of soybeans.] Gráfica Artex Ltda., Pelotas, Brasil. 24 p. refs.
- #42. ———, and A. RUFFINELLI. 1971. Fauna de Lepidoptera del Uruguay. X. Agaristidae, Noctuidae et Thyatiridae. [Fauna of Lepidoptera of Uruguay. X. Agaristidae, Noctuidae and Thyatiridae.] Uruguay Min. Agr. Gan. Centro Invest. Sanid. Veg. Publ. Tec. (Ser. Zool. Agr.) 2. 30 p.
43. ———, ———, and C. S. CARBONELL. 1957. Lepidoptera del Uruguay. [Lepidoptera of Uruguay.] Rev. Fac. Agron. Univ. Repub. Uruguay 46. 152 p. refs.
- #44. ———, ———, and ———. 1962. Lepidoptera del Uruguay. [Lepidoptera of Uruguay.] Rev. Fac. Agron. Univ. Repub. Uruguay 50. 166 p.
45. BIRSELL, T. L. 1939/1940. Miscellaneous insects. Ga. Exp. Sta. Annu. Rep. 52:62-64. illus.
46. ———, and C. H. ALDEN. 1945. Control of insect pests of peanuts in the field. Ga. Exp. Sta. Press. Bull. 546. 1 p.
47. BLACKWELL, C. P. 1926/1930. Report shows Oklahoma is pest center. Okla. Agr. Exp. Sta. Rep. 1926/1930:270-273.
48. BLEDSOE, R. W., H. C. HARRIS, and F. CLARK. 1945. The importance of peanuts left in the soil in the interpretation of increases in yield due to sulfur treatments. J. Amer. Soc. Agron. 37(9):689-695. illus. refs.
49. BLICKENSTAFF, C. C., and J. L. HUGGANS. 1962. Soybean insects and related arthropods in Missouri. Mo. Agr. Exp. Sta. Res. Bull. 803. 51 p. illus. refs.
50. ———, and ———. 1974. Soybean insects and related arthropods in Missouri. Mo. Agr. Exp. Sta. Res. Bull. 803 (Rev.). 47 p. illus. refs.
51. BOYD, F. T. 1939/1940. Grain crop investigations. Fla. Agr. Exp. Sta. Annu. Rep. 1939/1940:182-183.
52. BUICE-NO V. A. 1971. Contribucion al conocimiento de los insectos del mani (*Arachis hypogaea* L.) en el Zulia. [Contribution to the knowledge of the insects of the peanut (*Arachis hypogaea* L.) in Zulia.] (English summary.) Agron. Trop. (Maracay) 21(1):33-37. illus. refs.
53. BRIMLEY, C. S. 1938. The insects of North Carolina.

- North Carolina Department of Agriculture, Division of Entomology, Raleigh, N.C. 560 p.
54. BROERESMA, D. B. 1968. The soybean insect situation. *Proc. N. Cent. Br. Entomol. Soc. Amer.* 23(1):65-66.
  55. BRUNER, S. C. 1929/1930. Informe del Departamento de Entomología y Fitopatología, ejercicio de 1929 a 1930. [Report of the Department of Entomology and Phytopathology for 1929 to 1930.] Santiago de las Vegas Cuba Estac. Exp. Agron. Informe 1929/1930. 74 p. illus. refs.
  56. ———, and J. B. DESCHAPELLES. 1946. La palomilla del maíz o gusano de la yerba y medios de combatirla. [The fall armyworm and methods of combating it.] Santiago de las Vegas Cuba Estac. Exp. Agron. Circ. 84. 12 p. illus.
  57. BURLEIGH, J. G. 1972. Population dynamics and biotic controls of the soybean looper in Louisiana. *Environ. Entomol.* 1(3):290-294. illus. refs.
  58. BUTLER, A. G. 1878. On a small collection of Lepidoptera from Jamaica. *Proc. Zool. Soc. London* 1878:480-495. refs.
  59. ———. 1879. On the Lepidoptera of the Amazons, collected by Dr. James W. H. Trail, during the years 1873 to 1875. *Trans. Entomol. Soc. London* 1879(1):19-76. refs.
  60. ———. 1895. Notes on the synonymy of noctuid moths. *Entomologist* 28(387):222-227. refs.
  61. CAMPOS PALOMINO, J. 1965. Investigaciones sobre el control biológico del "cogollero" del maíz, *Spodoptera frugiperda* (J. E. Smith) y otros noctuides. [Investigations on the biological control of *Spodoptera frugiperda* and other noctuids.] (English summary.) *Rev. Peru. Entomol.* 8(1):126-131. illus. refs.
  62. CHAPIN, J. B., and P. S. CALLAHAN. 1967. A list of the Noctuidae (Lepidoptera, Insecta) collected in the vicinity of Baton Rouge, Louisiana. *Proc. La. Acad. Sci.* 30:39-48. illus. refs.
  63. CHITTENDEN, F. H. 1905. The caterpillar of *Anticarsia gemmatilis* injuring velvet bean. *U.S. Dep. Agr. Bur. Entomol. Bull.* 54:77-79. illus.
  64. COSTA, R. G. 1958. Alguns insetos e outros pequenos animais que danificam plantas cultivadas no Rio Grande do Sul. [Some insects and other small animals that damage cultivated plants in Rio Grande do Sul.] *Secr. Est. Neg. Agr. Ind. Comerc. S.I.P.A. (Ser. A)* 172. 296 p. illus. refs.
  65. COTTON, R. T. 1918. Insectos que atacan las hortalizas en Puerto Rico. [Insects that attack vegetables in Puerto Rico.] *Rev. Agr. P. R.* 1(5):198-212. illus.
  66. ———. 1918. Insects attacking vegetables in Porto Rico. *J. Dep. Agr. P. R.* 2(4):265-313. illus.
  67. CREIGHTON, C. S., T. L. MCFADDEN, and E. R. CUTHBERT. 1973. Supplementary data on phenylacetaldehyde: An attractant for Lepidoptera. *J. Econ. Entomol.* 66(1):114-115. illus. refs.
  68. CRUMB, S. E. 1956. The larvae of the Phalaenidae. *U.S. Dep. Agr. Tech. Bull.* 1135. 356 p. illus. refs.
  69. DAANE, A. 1931/1932. Forage crop investigations. *Fla. Agr. Exp. Sta. Annu. Rep.* 1931/1932:180-184.
  70. DASH, J. S. 1914/1915. Report of the Assistant Superintendent of Agriculture on the entomological and mycological work carried out during the season under review. *Barbados Dep. Agr. Rep.* 1914/1915:38-44. illus.
  71. ———. 1918/1919. Insectes. In: *Rapport de l'Entomologiste et Pathologiste. [Insects. In: Report of the Entomologist and Pathologist.]* Pointe-a-Pitre Guadeloupe Sta. Agr. Rapp. 1:29-32. illus.
  72. DAVIDSON, R. H., and L. M. PEAIRS. 1966. Insect pests of farm, garden, and orchard. *John Wiley & Sons, Inc., New York.* 6th Ed. 675 p. illus. refs.
  73. DOUGLAS, W. A. 1929. Caterpillar attacking soy beans, controlled by sodium fluosilicate. *Rice J.* 32(12):24.
  74. ———. 1930. The velvet bean caterpillar as a pest of soy beans in southern Louisiana and Texas. *J. Econ. Entomol.* 23(4):684-690. refs.
  75. DOZIER, H. L. 1918. An annotated list of Gainesville, Florida, Coleoptera. *Entomol. News* 29(8.9.10):295-298, 331-335, 370-374.
  76. DRUCE, H. 1884. On a collection of Heterocera from Dominica. *Proc. Zool. Soc. London* 1884:321-326. refs.
  77. ———. 1900. Insecta. *Lepidoptera-Heterocera.* *Biol. Cent.-Amer.* 1:1-490. refs.
  78. DUGAS, A. L. 1945. Insecticidal tests on the control of the velvetbean caterpillar. *Proc. Cotton States Br. Amer. Assoc. Econ. Entomol.* 19:94-97. illus. refs.
  79. ———, and E. J. CONCIENNE. 1947. Control of the velvetbean caterpillar, *Anticarsia gemmatilis* (Hbn.) on soybeans in Louisiana. *Proc. Assoc. S. Agr. Workers* 44:123-124.
  80. ———, and J. GRAY. 1943/1944. Velvetbean caterpillar control on soybeans and peanuts. *La. Agr. Exp. Sta. Annu. Rep.* 1943/1944:83-86. illus.
  81. ———, and C. E. SMITH. 1944/1945. Velvetbean caterpillar on soybeans can be controlled with DDT or cryolite. *La. Agr. Exp. Sta. Annu. Rep.* 1944/1945:59-60.
  82. ———, and E. J. CONCIENNE. 1945/1946. Velvetbean caterpillar control on soybeans. *La. Agr. Exp. Sta. Annu. Rep.* 1945/1946:54-55.
  83. ———, and ———. 1946/1947. Velvetbean caterpillar. *La. Agr. Exp. Sta. Annu. Rep.* 1946/1947:55-56.
  84. DYAR, H. G. 1902. A list of North American Lepidoptera and key to the literature of this order of insects. *Bull. U.S. Nat. Mus.* 52. 723 p. refs.
  85. EDDY, C. O. 1939. Insects important in the production of sugarcane. *Sugar Bull.* 18:5-7.
  86. ———. 1940. Cryolite as an insecticide. *La. Agr. Exp. Sta. Bull.* 323:3-5.
  87. ———. 1941/1942. Cryolite necessary for effective soybean seed production. *La. Agr. Exp. Sta. Annu. Rep.* 1941/1942:74.
  88. ———. 1942. Cryolite as an insecticide. *No. 2.* *La. Agr. Exp. Sta. Bull.* 350:9-11. illus.
  89. ———. 1942. Cryolite controls many insects. *Sugar Bull.* 20:77-79. illus.
  90. ELLISOR, L. O. 1938. Control of the velvet bean caterpillar, *Anticarsia gemmatilis*, Hbn. in seed production. *La. Agr. Exp. Sta. Bull.* 298:8-9.
  91. ———. 1942. Notes on the biology and control of the velvetbean caterpillar, *Anticarsia gemmatilis* Hbn. *La. Agr. Exp. Sta. Bull.* 350:17-23. refs.
  92. ———, and C. R. BLAIR. 1940. Effect of temperature upon the toxicity of stomach poisons. *J. Econ. Entomol.* 33(5):760-762. illus. refs.
  93. ———, and E. H. FLOYD. 1938. Toxicity of several stomach-poison insecticides to four species of lepidopterous larvae. *J. Econ. Entomol.* 31(1):65-68. illus. refs.

94. ———, and ———. 1939. Further investigations on the control of the velvetbean caterpillar, *Anticarsia gemmatilis* (Hbn.). J. Econ. Entomol. 32(6):863-867. illus.
95. ———, J. H. GAYDEN, and E. H. FLOYD. 1938. Experiments on the control of the velvetbean caterpillar, *Anticarsia gemmatilis* (Hbn.). J. Econ. Entomol. 31(6):739-742. illus. refs.
96. ———, and L. T. GRAHAM. 1937. A recent pest of alfalfa. J. Econ. Entomol. 30(2):278-280. refs.
97. ENGLISH, L. L. 1943/1944. Control of the velvetbean caterpillar on soybeans and peanuts. Ala. Agr. Exp. Sta. Annu. Rep. 54/55:28.
98. ———. 1946. Control of the peanut worm. Ala. Agr. Exp. Sta. Progr. Rep. Ser. 26. 3 p.
99. ———. 1946. The velvetbean caterpillar on peanuts: Control experiments. J. Econ. Entomol. 39(4):531-533. illus. refs.
100. ETCHEVERRY C., M. 1953. Identificaciones lepidopterológicas. [Lepidopterological identifications.] (English summary.) Rev. Chilena Entomol. 3:126-131. illus. refs.
101. EVANS, W. 1968. Fighting the pests that eat soybean profits. Farm Quart. 23(2):102-105, 117-120. illus. refs.
102. FAGUNDES, A. C. 1962. Lagartas que atacam as folhas da soja. [Caterpillars that attack soybean leaves.] Correio Agro-Pecuar. (São Paulo) 2(4):55.
103. ———, and O. BAUCKE. 1962. Ensaio de campo com polvilhação visando o controle à "lagarta da soja" *Anticarsia gemmatilis* (Hüb., 1818) Lepidoptera-Noctuidae [Field experiment in an attempt at control of soybean caterpillar *Anticarsia gemmatilis* Lepidoptera-Noctuidae through spraying.] Rev. Fac. Agron. Vet. Univ. Rio Grande do Sul 5(2):95-98. illus.
104. FALTER, J. 1969. Soybean insect control. N. C. State Univ. Agr. Ext. Serv. Insect Notes, Grains & Soybeans Note 1. 6 p. illus.
105. FAWCETT, H. S. 1948. Biological control of citrus insects by parasitic fungi and bacteria. In: L. D. Batchelor and H. J. Webber, Eds. The citrus industry. Volume II. Production of the crop. University of California Press, Berkeley. p. 627-664. illus. refs.
106. FENNAH, R. G. 1945. Preliminary tests with DDT against insect pests of food-crops in the Lesser Antilles. Trop. Agr. (Trinidad) 22(12):222-226. illus.
107. FERREIRA, E. 1970. Pragas da soja no Rio Grande do Sul. [Pests of soybeans in Rio Grande do Sul.] Presented at No. I Simpósio Brasileiro de Soja. 11 p. illus. refs.
108. FORBES, W. T. M. 1914. A table of the genera of Noctuidae of northeastern North America. J. N. Y. Entomol. Soc. 22(1):1-33. illus.
109. ———. 1954. Lepidoptera of New York and neighboring states. Noctuidae. Part III. Cornell Univ. Agr. Exp. Sta. Mem. 329. 433 p. illus.
110. FRENCH, J. C., and M. P. NOLAN, JR. 1971. Soybean insects and their control. Univ. Ga. Coop. Ext. Serv. Leaflet. 29 (Rev.). [2 p.] illus.
111. FROST, S. W. 1964. Insects taken in light traps at the Archbold Biological Station, Highlands County, Florida. Fla. Entomol. 47(2):129-161. refs.
112. GALLO, D., and C. H. W. FLECHTMANN. 1962. As mais importantes pragas das grandes culturas. [The most important pests of the great crops.] Bol. Didático Esc. Super. Agr. "Luiz de Queiroz" Univ. São Paulo 3:1-144.
113. ———, O. NAKANO, F. M. WIENDL, S. SILVEIRA NETO, and R. P. L. CARVALHO. 1970. Manual de entomologia. [Manual of entomology.] Editora Agronomica Ceres, São Paulo, Brasil. 858 p. illus. refs.
114. GENTING, W. G., and V. E. GREEN, JR. 1962. Insects attacking soybeans with emphasis on varietal susceptibility. Proc. Soil Crop Sci. Soc. Fla. 22:138-142. refs.
115. GONZÁLEZ, A. DE J. 1932. Cultivo y utilización de la soja como forraje. [Cultivation and utilization of soybeans as forage.] Rev. Agr. Comerc. Trabajo (Cuba) 14(3):5-42. illus. refs.
116. GREENE, G. L., J. C. REID, V. N. BLOUNT, and T. C. RIDDLE. 1973. Mating and oviposition behavior of the velvetbean caterpillar in soybeans. Environ. Entomol. 2(6):1113-1115. illus. refs.
117. GROSSBECK, J. A. 1917. Insects of Florida. IV. Lepidoptera. Bull. Amer. Mus. Natur. Hist. 37:1-147.
118. GROTE, A. R. 1874. List of the Noctuidae of North America. Bull. Buffalo Soc. Natur. Sci. 2:1-77. refs.
119. ———. 1876. Check list of the Noctuidae of America, north of Mexico. Part 2. Buffalo Freie Press, Buffalo, N.Y. p. 29-50.
120. ———. 1879. Notes on Noctuidae. Can. Entomol. 11(9):179-180.
121. ———. 1880. North American Noctuidae in the Zutræge. Can. Entomol. 12(5):84-88.
122. ———. 1880. Variability of *Anticarsia*. N. Amer. Entomol. 1(12):103.
123. ———. 1882. New check list of North American moths. A. R. Grote, New York. 73 p.
124. GUENÉE, M. A. 1852. Histoire naturelle des insectes. Species générale des Lépidoptères. Tome VII. Noctuides. Tome III. [Natural history of insects. General species of Lepidoptera. Tome VII. Noctuidae. Tome III.] Librairie Encyclopédique de Roret, Paris. 442 p. refs.
125. GUIDO, A. S., and A. RUFFINELLI. 1956. Primer catalogo de los parasitos y predadores encontrados en el Uruguay. [First catalog of the parasites and predators found in Uruguay.] Proc. 10th Int. Congr. Entomol. (Montreal) 4:913-924. refs.
126. GUNDLACH, J. 1881. Contribución a la entomología Cubana. [Contribution to Cuban entomology.] Imprenta de G. Montiel, Habana. 445 p. refs.
127. ———. 1891. Apuntes para la fauna Puerto-Riqueña. [Notes on the Puerto Rican fauna.] An. Soc. Espan. Hist. Natur. 20:109-207. refs.
128. GUYTON, F. E. 1940. An outbreak of the velvetbean caterpillar in Alabama with data on control. J. Econ. Entomol. 33(4):635-639. illus. refs. maps.
129. GYRISCO, G. G. 1958. Forage insects and their control. Annu. Rev. Entomol. 3:421-448. refs.
130. HAMBLETON, E. J. 1935. Alguns dados sobre Lepidopteros Brasileiros do Estado de Minas Geraes. [Some information on the Brazilian Lepidoptera of the state of Minas Geraes.] Rev. Entomol. (Rio de Janeiro) 5(1):1-7.
131. ———, and W. T. M. FORBES. 1935. Uma lista de Lepidoptera (Heterocera) do Estado de Minas Geraes. [A list of Lepidoptera (Heterocera) of the state of Minas Geraes.] (English summary) Arch. Inst. Biol. (São Paulo) 6:213-256.
132. HARRIS, H. C., W. B. TISDALE, and A. N. TISSOT. 1946.

- Importance of experimental technique in fertilizer, dusting and calcium experiments with Florida runner peanuts. Soil Sci. Soc. Amer. Proc. 11:413-416. illus. refs.
133. HAYWARD, K. J. 1927. Miscellaneous notes from Argentina. IX. Entomol. Rec. J. Var. 39(11):157-159.
134. ———. 1940. Departamento de Entomología. [Department of Entomology.] Rev. Ind. Agr. Tucuman 31(1-3):50-58. illus.
135. ———. 1942. Primera lista de insectos Tucumanos perjudiciales. [First list of harmful Tucuman insects.] Tucuman Estac. Exp. Agr. Publ. Misc. 1. 110 p. refs.
- #136. ———. 1969. Datos para el estudio de la ontogenia de Lepidópteros Argentinos. [Datum for the study of the ontogeny of Argentinean Lepidoptera.] Fdn. M. Lillo Univ. Nac. Tucuman Misc. 31. 142 p.
- #137. HERRICH-SCHÄFFER, G. A. W. 1864-1871. Die Schmetterlinge der Insel Cuba, nach natürlichen Exemplaren und Notizen des Herrn Dr. Gundlach in Habana zugesammengestellt von Dr. Herrich-Schäffer. [The Lepidoptera of the island of Cuba, according to the natural examples and notes of Herrn Dr. Gundlach in Havana compiled by Dr. Herrich-Schäffer.] CorrespBl. Zool.-Miner. Ver. Regensburg.
138. HINDS, W. E. 1930. The occurrence of *Anticarsia gemmatilis* as a soybean pest in Louisiana in 1929. J. Econ. Entomol. 23(4):711-714. illus.
139. ———. 1930. The occurrence of *Anticarsia gemmatilis* as a soybean pest in Louisiana in 1929. Proc. Assoc. S. Agr. Workers 31:422-433.
140. ———. 1931. A new economic species attacking soybean hay in Louisiana (*Herulia psammioxantha* Dyar). J. Econ. Entomol. 24(4):833-835. illus.
141. ———. 1933. Trichogramma helping in control of soybean caterpillars. Sugar Bull. 11(23):3.
142. ———, and B. A. OSTERBERGER. 1931. The soybean caterpillar in Louisiana. J. Econ. Entomol. 24(6):1168-1173. illus.
143. HINSON, K. 1967. Soybeans in Florida. Fla. Agr. Exp. Sta. Bull. 716. 121 p. illus. refs.
144. HOLLAND, W. J. 1903. The moth book. Doubleday, Page & Company, New York. 479 p. illus. refs.
145. HOWLAND, J. E. 1946. Record peanut crop saved from peanut worm. Better Homes Gard. 25(4):136.
146. HUNNER, J. 1816. Verzeichniss bekannter Schmetterlinge. [Catalog of the known Lepidoptera.] Augsburg. 431 p. refs.
147. ———. 1818. Beiträge zur Sammlung exotischer Schmetterlinge, bestehend in Bekundigung einzelner Fliegmuster neuer oder rarer nichteuropäischer Gattungen. [Supplement to the collection of exotic Lepidoptera. . . .] Augsburg. 172 color plates.
148. HUGHES, K. M. 1957. An annotated list and bibliography of insects reported to have virus diseases. Hilgardia 26(14):597-629. refs.
149. JENKINS, J. M. 1930. Entomological investigations. In: Report of the Rice Experiment Station for the years 1928-1929. La. Agr. Exp. Sta. Bull. 205:11-12.
150. JORDAN, C. R. 1967. Soybean insects and their control. Univ. Ga. Coop. Ext. Serv. Leaflet. 29 (Rev.). [2 p.] illus.
151. KIMBALL, C. P. 1965. Arthropods of Florida and neighboring land areas. Volume 1. Lepidoptera of Florida. Division of Plant Industry, State of Florida Department of Agriculture, Gainesville. 363 p. illus. refs.
152. KING, G. H. 1947. Entomology. In: Twenty-seventh annual report, Georgia Coastal Plain Experiment Station, 1946-1947. Ga. Coastal Plain Exp. Sta. Bull. 44:42-45.
153. KULASH, W. M. 1947. Benzene hexachloride, DDT and *Rygonex* to control soybean caterpillars. J. Econ. Entomol. 40(6):927-928. illus. refs.
154. LASTER, M. L. 1962. Insects affecting soybeans in the South. Soybean Dig. 22(9):14-16. illus.
155. LEDBETTER, R. J., and M. H. BASS. 1971. Soybean insects and their control. Auburn Univ. Coop. Ext. Serv. Circ. E-3. 7 p. illus.
156. LEONARD, M. D., Ed. 1926. A list of the insects of New York with a list of the spiders and certain other allied groups. Cornell Univ. Agr. Exp. Sta. Mem. 101. 1,121 p.
157. LEUCK, D. B., R. O. HAMMONS, L. W. MORGAN, and J. E. HARVEY. 1967. Insect preference for peanut varieties. J. Econ. Entomol. 60(6):1546-1549. illus. refs.
158. ———, and J. L. SKINNER. 1971. Resistance in peanut foliage influencing fall armyworm control. J. Econ. Entomol. 64(1):148-150. illus. refs.
159. LIMA, A. M. da C. 1936. Terceiro catalogo dos insetos que vivem nas plantas do Brasil. [Third catalog of insects that live on plants of Brazil.] Ministério da Agricultura, Departamento Nacional da Produção Vegetal, Escola Nacional de Agronomia, Rio de Janeiro. 460 p. refs.
160. ———. 1950. Insetos do Brasil. 6o. Tomo. Lepidópteros. 2a. Parte. [Insects of Brazil. Volume 6. Lepidoptera. Part 2.] Escola Nacional de Agronomia, Rio de Janeiro, Serie didática No. 8. 420 p. illus. refs.
161. LINCOLN, C., and F. D. MINER. 1945. Insect pests of grain, hay, and pasture crops. Ark. Agr. Exp. Sta. Ext. Serv. Circ. 437. 19 p. illus.
162. LOBBELL, R. N. 1930/1931. Insect pests and their control. Fla. Agr. Exp. Sta. Annu. Rep. 45:149-152. illus.
163. ———. 1933/1934. Insect pests and their control. Fla. Agr. Exp. Sta. Annu. Rep. 1933/1934:93-94.
164. ———. 1934/1935. Insect pests and their control. Fla. Agr. Exp. Sta. Annu. Rep. 1934/1935:109-112. illus.
165. LUCKMANN, W. H. 1971. The insect pests of soybeans. World Farming 13(5):18-19. 22. illus.
- #166. LUDWIG, J. M. 1957. Lagarta da soja. [Soybean caterpillar.] Agrotecnia (Porto Alegre) 1(3):29-33.
167. LYLE, C. 1944. Caterpillar may attack kudzu, soys. Miss. Farm Res. 7(9):1.
168. ———. 1945. Watch soybeans for caterpillars. Miss. Farm Res. 8(8):1.
169. McDUNNOUGH, J. 1938. Check list of the Lepidoptera of Canada and the United States of America. Part I. Macrolepidoptera. Mem. S. Calif. Acad. Sci. 1. 272 p.
170. MARCOVITCH, S. and W. W. STANLEY. 1942. Fluorine compounds useful in the control of insects. Tenn. Agr. Exp. Sta. Bull. 182. 46 p. illus. refs.
171. MARCONI, F. A. M. 1958. Insetícidias e seu emprego no combate às pragas. [Insecticides and their use in the combat of pests.] Editora Agronomica "Ceres" Ltda., São Paulo. 531 p. illus. refs.

172. ———. 1963. Insetídeas e seu emprêgo no combate às pragas (com uma introdução sobre o estudo dos insetos). [Insecticides and their use in the combat of pests (with an introduction on the study of insects).] Editora Akronomica "Ceres" Ltda., São Paulo. 2nd Ed. 607 p. illus. refs.
173. MARTORELL, L. F. 1945. A survey of the forest insects of Puerto Rico. J. Agr. Univ. P. R. 29(3,4): 69-608. illus. refs.
174. MENKE, W. W. 1973. A computer simulation model: The velvetbean caterpillar in the soybean agroecosystem. Fla. Entomol. 56(2):92-102. illus. refs.
175. MISSISSIPPI COOPERATIVE EXTENSION SERVICE. 1969. Entomology facts. Know your worms on soybeans. Miss. State Univ. Coop. Ext. Serv. Inform. Sheet 225. 2 p. illus.
176. MORSE, W. J., and J. L. CARTER. 1969. Soybeans: Culture and varieties. U.S. Dep. Agr. Farmers Bull. 1520 (Rev.). 39 p. illus.
177. ———, and L. F. WILLIAMS. 1949. Soybeans: Culture and varieties. U.S. Dep. Agr. Farmers Bull. 1520 (Rev.). 38 p. illus.
178. MOSCHLER, H. B. 1880. Beiträge zur Schmetterlings-Fauna von Surinam. III. [Contributions to the lepidopterous fauna of Surinam. III.] Verh. K. K. Zool.-Bot. Ges. Wien 30:379-486. refs.
179. ———. 1886. Beiträge zur Schmetterlings-Fauna von Jamaica. [Contributions to the lepidopterous fauna of Jamaica.] Abh. Senckenberg. Naturforsch. Ges. 14(3):25-88. refs.
180. ———. 1889. Die Lepidopteren-Fauna der Insel Portorico. [The lepidopterous fauna of the island of Porto Rico.] Abh. Senckenberg. Naturforsch. Ges. 16(1):69-360. illus. refs.
181. MORTSINGER, R. E., J. L. BAGENT, S. D. HENSLEY, N. L. HORN, and L. D. NEWSOM. 1967. Soybean diseases and insects of Louisiana. La. Coop. Ext. Serv. Publ. 1558. 24 p. illus.
182. MULLETT, R. P. 1955. Insects and pests of field crops. Tenn. Agr. Exp. Sta. Ext. Serv. Publ. 360. 40 p. illus.
183. MYERS, C. V. 1940. Insects inhabiting soybean fields. M. Sci. Thesis, University of Illinois. 69 p. illus. refs.
184. NEAL, T. M., G. L. GREENE, F. W. MEAD, and W. H. WHITCOMB. 1972. *Spanogonicus albifasciatus* (Hemiptera: Miridae): A predator in Florida soybeans. Fla. Entomol. 55(4):247-250. illus. refs.
185. ———, and W. H. WHITCOMB. 1972. Odonata in the Florida soybean agroecosystem. Fla. Entomol. 55(2):107-114. refs.
186. NETTLES, W. C. 1942. Cryolite controls soybean caterpillar. Clemson Agr. Coll. Ext. Serv. Inform. Card 65. 2 p. illus.
187. ———. 1958. Soybean insects and their control. Clemson Agr. Coll. Ext. Serv. Circ. 450. 10 p. illus.
188. ———, F. H. SMITH, and C. A. THOMAS. 1966. Soybean insects and diseases. How to control. Clemson Univ. Agr. Ext. Serv. Circ. 504. 21 p. illus.
189. ———, and ———. 1967. Soybean insects and diseases. How to control. Clemson Univ. Agr. Ext. Serv. Circ. 504 (Rev.). 23 p. illus.
190. ———, and ———. 1968. Soybean insects and diseases. How to control. Clemson Univ. Agr. Ext. Serv. Circ. 504 (Rev.). 25 p. illus.
191. ———, C. A. THOMAS, and F. H. SMITH. 1970. Soybean insects and diseases. How to control. Clemson Univ. Agr. Ext. Serv. Circ. 504 (Rev.). 25 p. illus.
192. NEWELL, W., and E. W. BERGER. 1922. Insects injurious to the principal crops of the South. Fla. State Plant Bd. Quart. Bull. 6(4):97-116. refs.
193. NICKEL, J. L. 1958. Agricultural insects of the Paraguayan Chaco. J. Econ. Entomol. 51(5):633-637. illus. refs.
194. NICKELS, C. B. 1926. An important outbreak of insects infesting soy beans in lower South Carolina. J. Econ. Entomol. 19(4):614-618. illus.
195. NORMAN, A. G., Ed. 1963. The soybean: Genetics, breeding, physiology, nutrition, management. Academic Press, New York. 239 p. illus. refs.
196. PACHECO, F. 1970. Plagas del Valle del Yaqui. [Pests of the Yaqui Valley.] Mex. Inst. Nac. Invest. Agr. SAG. Circ. CIANO 53. 124 p. illus. refs.
197. PACKARD, C. M. 1945. Experiments with DDT for control of insects attacking cereal and forage crops in the field and in storage. U.S. Dep. Agr. Bur. Entomol. Plant Quar. B-640. 9 p.
198. ———. 1951. Insect pests of soybeans and their control. Soybean Dig. 11(4):14-18. illus.
199. PALMER, J. H., C. N. NOLAN, C. L. PARKS, F. H. SMITH, M. C. MCKENZIE, and C. A. THOMAS. 1972. Produce more high quality soybeans. Clemson Univ. Agr. Ext. Serv. Circ. 501 (Rev.). 7 p. illus. maps.
200. PARKER, H. L. 1953. Miscellaneous notes on South American dipterous parasites. Boll. Lab. Entomol. Agr. "Filippo Silvestri" 12:45-73. illus. refs.
201. ———, P. A. BERRY, and A. SILVEIRA GUIDO. 1951. Host-parasite and parasite-host lists of insects reared in the South American Parasite Laboratory during the period 1940-1946. Rev. Assoc. Ing. Agron. 23(92):15-112.
202. PEARS, L. M. 1941. Insect pests of farm, garden, and orchard. John Wiley & Sons, Inc., New York. 4th Ed. 549 p. illus. refs.
203. ———, and R. H. DAVIDSON. 1956. Insect pests of farm, garden, and orchard. John Wiley & Sons, Inc., New York. 5th Ed. 661 p. illus. refs.
204. PETCH, T. 1925. Studies in entomogenous fungi. VII. *Spicaria*. Trans. Brit. Mycol. Soc. 10:183-189. illus. refs.
205. PETERSON, A. 1948. Larvae of insects. Part I. Lepidoptera and plant infesting Hymenoptera. Alvah Peterson, Columbus, Ohio. 315 p. illus. refs.
206. ———. 1964. Egg types among moths of the Noctuidae (Lepidoptera). Fla. Entomol. 47(2):71-91. illus. refs.
207. PETTY, H. B. 1967. How to control soybean insects. Farm Tech. 23(1):42A-47A. illus.
208. ———. 1967. How to control soybean insects. Soybean Dig. 27(4):42A-47A. illus.
209. PIPER, C. V., and W. J. MORSE. 1922. The velvet bean. U.S. Dep. Agr. Farmers Bull. 1276. 27 p. illus. maps.
210. ———, and ———. 1938. The velvetbean. U.S. Dep. Agr. Farmers Bull. 1276 (Rev.). 21 p. illus. maps.
211. ———, and ———. 1939. The velvet bean. Fla. Dep. Agr. Bull. (n.s.) 68:52-65. illus.
212. PLANK, H. K. 1944. Insect pests of food crops. P. R. Fed. Exp. Sta. (Mayaguez) Rep. 1944:26-27.
213. PUTSWELL, H. D. 1948. Seasonal occurrence of the velvetbean caterpillar in southeastern Alabama including data on life history and toxicity tests with

- several organic insecticides. Ala. Polytech. Inst. Grad. Sch. Bull. 2:61-62.
214. RECO, C. DO V., J. G. GOMES, and G. B. ALVIM. 1945. Doenças e pragas das plantas de horta. [Diseases and pests of garden plants.] Min. Agr. (Rio de Janeiro) S.I.A. 166. 230 p. illus. refs.
  215. ———, and ———. 1952. Doenças e pragas das plantas de horta. Fascículo V. Família dasleguminosas. [Diseases and pests of garden plants. Part V. Leguminosae.] Min. Agr. (Rio de Janeiro) S.I.A. 166. 2nd Ed. p. 5-42. illus.
  216. RIZZO, H. R. E. 1971. Catálogo de Lepidópteros hallados en la Facultad de Agronomía y Veterinaria de Buenos Aires. [Catalog of the Lepidoptera found on the Faculty of Agronomy and Veterinary of Buenos Aires.] (English summary.) Univ. Buenos Aires Fac. Agron. Vet. Publ. Int. 2. 35 p. refs.
  217. ———. 1972. Enemigos animales del cultivo de la soja. [Animal enemies of the cultivation of soybeans.] Rev. Inst. Bolsa Cereales 2851:1-6. illus. refs.
  218. ———. 1972. Insectos y otros animales enemigos de la soja (*Glycine max* (L) Merrill) en la Argentina. [Insects and other animal enemies of the soybean (*Glycine max* (L) Merrill) in Argentina.] (English summary.) Rev. Fitotec. Latinoamer. 8(3):44-49. refs.
  219. ROARK, R. C. 1944. A review of the insecticidal uses of rotenone and rotenoids from derris, lonchocarpus (cube and timbo), tephrosia, and related plants. Part VII: Lepidoptera. U.S. Dep. Agr. Bur. Entomol. Plant Quar. E-625. 226 p. refs.
  220. ———, and N. E. MCINNOO. 1944. A digest of the literature on DDT through April 30, 1944. U.S. Dep. Agr. Bur. Entomol. Plant Quar. E-631. 53 p. refs.
  221. ROBERTS, J. E., SR., and J. C. SMITH. 1972. Insect control recommendations. Control soybean insects. Va. Polytech. Inst. Ext. Div. Contr. Ser. 137. 4 p. illus.
  222. ROWELL, J. O. 1965. Control soybean insects. Va. Polytech. Inst. Agr. Ext. Serv. Circ. 648 (Rev.). [5 p.] illus.
  223. ———, and G. M. BOUSH. 1963. Control soybean insects. Va. Polytech. Inst. Agr. Ext. Serv. Circ. 648 (Rev.). 4 p. illus.
  224. RUFFIN, W. A. 1947. Making the recommendation possible. Ext. Serv. Rev. 18(2):21.
  225. SANBORN, C. E. 1930/1932. Study of many insect pests needed. Okla. Agr. Exp. Sta. Bien. Rep. 1930/1932:244-248.
  226. SANDERSON, E. D., and L. M. PEAIRS. 1931. Insect pests of farm, garden, and orchard. John Wiley & Sons, Inc., New York. 3rd Ed. 568 p. illus. refs.
  227. SARMENTO, A. A. 1958. Lagartas prejudiciais às nossas plantas cultivadas. [Caterpillars harmful to our cultivated plants.] Minas Gerais Brasil Dep. Prod. Veg. Bol. Agr. 7(11-12):13-26.
  228. SCHAUSS, W. 1940. Insects of Porto Rico and the Virgin Islands—Moths of the family Noctuidae. In: Scientific survey of Porto Rico and the Virgin Islands. New York Academy of Sciences, New York. Vol. XII, Part 2. p. 177-290. refs.
  229. SCHLOTTFELDT, C. S. 1944. Insetos encontrados em plantas cultivadas e comuns—Viçosa, Minas Gerais. [Insects found on cultivated and common plants—Viçosa, Minas Gerais.] Rev. Ceres 6(31):52-65.
  230. ———. 1944. Insetos encontrados em plantas cultivadas e comuns—Viçosa, Minas Gerais. [Insects found on cultivated and common plants—Viçosa, Minas Gerais.] Rev. Ceres 6(32):108-126.
  231. SCOTT, J. M. 1909/1910. The velvet bean. Fla. Dep. Agr. Bien. Rep. 11:174-195. illus.
  232. ———. 1910. The velvet bean. Fla. Agr. Exp. Sta. Bull. 102:43-58. illus.
  233. SCOTT, W. O., and S. R. ALDRICH. 1970. Various soybean crop ailments. In: Modern soybean production. The Farm Quarterly, Cincinnati. p. 126-149. illus.
  234. SICHMANN, W. 1963. Principais pragas da cultura do amendoim. [Principal pests of the culture of peanuts.] Bol. Campo (Rio de Janeiro) 19(173):18-22. illus.
  235. SILVA, A. G., C. R. GONÇALVES, D. M. GALVÃO, A. J. L. GONÇALVES, J. GOMES, M. N. SILVA, and L. SIMONI. 1967-1968. Quarto catálogo dos insetos que vivem nas plantas do Brasil. Seus parasitos e predadores. [Fourth catalog of insects that live on plants in Brazil. Their parasites and predators.] Ministério da Agricultura, Rio de Janeiro. Parte II, 1°. Tomo. 622 p. refs.
  236. SILVEIRA NETO, S. E. BERTI FILHO, and R. P. L. CARVALHO. 1973. Flutuação populacional de algumas pragas da soja em Assis—SP. [Population fluctuation of some pests of soybeans in Assis.] (English summary.) Solo Cent. Acad. "Luiz de Queiroz" Univ. São Paulo 64(1):21-25. illus. refs.
  237. SMITH, C. F. 1946. Controlling soybean insects. Res. Farming (N. C. Agr. Exp. Sta.) 4(3):7, 9. illus.
  238. SMITH, J. B. 1882. A synopsis of the North American genera of the Noctuidae. Bull. Brooklyn Entomol. Soc. 5(1):3-6.
  239. ———. 1891. List of the Lepidoptera of Boreal America. American Entomological Society. Philadelphia. 124 p.
  240. ———. 1893. A catalogue, bibliographical and synonymical, of the species of moths of the lepidopterous superfamily Noctuidae, found in Boreal America with critical notes. Bull. U.S. Nat. Mus. 44. 424 p. refs.
  241. ———. 1903. Check list of the Lepidoptera of Boreal America. American Entomological Society, Philadelphia. 136 p.
  242. SMITH, J. C. 1969. Soybean insect control by in-furrow systemic and foliar spray treatments. Soybean Dig. 29(10):16-18. illus.
  243. SPENCER, A. P. 1915. The velvet bean caterpillar. Fla. Grower 12(13):19.
  244. STEINHAUS, E. A. 1957. New records of insect-virus diseases. Hilgardia 26(7):417-430. illus. refs.
  245. STRAYER, J. R. 1973. Economic threshold studies and sequential sampling for management of the velvet-bean caterpillar, *Anticarsia gemmatilis* Hübner, on soybeans. Ph.D. Diss., Clemson University. 87 p. illus. refs.
  246. ———, and G. L. GREENE. 1971. Soybean insect control. Fla. Coop. Ext. Serv. Plant Prot. Pointers Ext. Entomol. Mimeo. 36. 5 p. illus.
  247. STUCKEY, H. P. 1939/1940. Miscellaneous insects. Ga. Exp. Sta. Annu. Rep. 52:62-64. illus.
  248. SUBER, E. F., and J. C. FRENCH. 1973. Soybean insects and their control. Univ. Ga. Coop. Ext. Serv. Leaflet. 29 (Rev.). [2 p.] illus.
  249. TELFORD, E. A., and N. F. CHILDERS. 1947. Tropical kudzu in Puerto Rico. P. R. Fed. Exp. Sta. (Mayaguez) Cir. 27. 30 p. illus. refs.
  250. TIETZ, H. M. 1952. The Lepidoptera of Pennsylvania.

- The Pennsylvania State College School of Agriculture, State College, Penn. 194 p. illus. refs.
251. ———. 1972. An index to the described life histories, early stages and hosts of the Macrolepidoptera of the continental United States and Canada. The Allyn Museum of Entomology, Sarasota, Fla. Vol. I. 536 p. refs.
  252. TIPPINS, H. H. 1963. Control of caterpillars on forage crops. Ga. Agr. Exp. Stas. Mimeo Ser. N. S. 160. 9 p. illus. refs.
  253. TODD, J. W., and T. D. CANERDAY. 1972. Control of soybean-insect pests with certain systemic insecticides. J. Econ. Entomol. 65(2):501-504. illus. refs.
  254. ———, N. A. MINTON, and P. D. DUKES. 1972. Infestations of phytophagous insects on soybeans following applications of du Pont 1410 foliar sprays and other insecticides applied to the soil. J. Econ. Entomol. 65(1):295-296. illus. refs.
  255. ———, and L. W. MORGAN. 1972. Effects of hand defoliation on yield and seed weight of soybeans. J. Econ. Entomol. 65(2):567-570. illus. refs.
  256. ———, M. B. PARKER, and T. P. GAINES. 1972. Populations of Mexican bean beetles in relation to leaf protein of modulating and non-modulating soybeans. J. Econ. Entomol. 65(3):729-731. illus. refs.
  257. TOWNSEND, C. H. T. 1916. Description of two new tachinids (Dip.). Entomol. News 27(5):217.
  258. TRACY, S. M., and H. S. COE. 1918. Velvet beans. U.S. Dep. Agr. Farmers Bull. 962. 39 p. illus. maps.
  259. TRULLINGER, R. W., et AL. 1945/1946. Insects as related to agriculture. U.S. Dep. Agr. Agr. Res. Serv. Rep. Stat. Agr. Exp. Stas. 1945/1946:104-117.
  260. TUGWELL, P., E. P. ROUSE, and R. G. THOMPSON. 1973. Insects in soybeans and a weed host (*Desmodium* sp.). Ark. Agr. Exp. Sta. Rep. Ser. 214. 18 p. illus. refs.
  261. TRIMPSSEED, S. G. 1965. Leaf damage in soybeans—can it lower yields? Clemson Univ. Agr. Res. 12(1):8. illus.
  262. ———. 1967. Systemic insecticides for control of soybean insects in South Carolina. J. Econ. Entomol. 60(4):1054-1056. illus. refs.
  263. ———. 1972. Management of insect pests of soybeans. Proc. Tall Timbers Conf. Ecol. Anim. Contr. Habitat Manage. 4:189-203. illus. refs.
  264. ———. 1972. Response of soybeans to foliage losses in South Carolina. J. Econ. Entomol. 65(1):224-229. illus. refs.
  265. ———, J. W. TODD, G. L. GREENE, and M. H. BASS. 1974. Minimum rates of insecticides on soybeans: Mexican bean beetle, green cloverworm, corn earworm and velvetbean caterpillar. J. Econ. Entomol. 67(2):287-291. illus. refs.
  266. USDA. 1952. Velvetbean caterpillar. U.S. Dep. Agr. Yearb. Agr. 1952:plate 69.
  267. ———. 1953. The velvetbean caterpillar. How to control it. U.S. Dep. Agr. Leaf. 348. 4 p. illus.
  268. ———. 1959. The velvetbean caterpillar. How to control it. U.S. Dep. Agr. Leaf. 348 (Rev.). 4 p. illus.
  269. USDA AGRICULTURAL RESEARCH SERVICE AND FOREST SERVICE. 1967. Suggested guide for the use of insecticides to control insects affecting crops, livestock, households, stored products, forests, and forest products—1967. U.S. Dep. Agr. Agr. Handb. 331. 273 p. illus.
  270. ———. 1968. Suggested guide for the use of insecticides to control insects affecting crops, livestock, households, stored products, forests, and forest products—1968. U.S. Dep. Agr. Agr. Handb. 331 (Rev.). 273 p. illus.
  271. VANCE, A. M. 1955. Pests that may attack your soybeans. Soybean Dig. 15(8):14-15. illus.
  272. VAN DINTHER, J. B. M. 1956. Soybean insects. Entomol. Ber. (Amsterdam) 16(6):104-109. illus. refs.
  - #273. VERNETT, F. DE J. 1962. Soja—combate às ervas daninhas, controle de doenças e pragas. [Soybean—combat of noxious weeds, and control of diseases and pests.] FIR (São Paulo) 4(5):37-41.
  274. VILELA, M. 1966. Resultados obtidos no primeiro ano de aplicação de *Malatol LVC* em algodão e soja. [Results obtained in the first year of applying *Malatol LVC* on cotton and soybean.] An. Reun. Fitosanit. Brasil 10:79-80. illus.
  275. VINSON, E. B. 1950. Parathion, toxaphene and DDT residues on peanut hay with field data on the use of these chemicals against certain peanut insects. Ala. Polytech. Inst. Grad. Sch. Bull. 3:81-82.
  276. WALKER, F. 1856-1858. List of the specimens of lepidopterous insects in the collection of the British Museum. Parts IX-XV. Noctuidae. The British Museum, London. p. 1-1888. refs.
  277. ———. 1869. Characters of undescribed Lepidoptera Heterocera. E. W. Janson, London. 112 p.
  278. WALTON, R. R., and C. F. STILES. 1952. The control of caterpillars attacking soybeans. Okla. Agr. Exp. Sta. Mimeo. Circ. M-239. 2 p.
  279. WATERS, H. A., E. D. WITMAN, and D. M. DELONG. 1939. Basic copper arsenate—a new insecticide. II. Insecticide and phytotoxicity studies. J. Econ. Entomol. 32(1):144-146.
  280. WATSON, J. R. 1911/1912. Insects of the year. Fla. Agr. Exp. Sta. Annu. Rep. 1911/1912:62-63.
  281. ———. 1912/1913. Destructive insects of the year. Fla. Agr. Exp. Sta. Annu. Rep. 1912/1913:65-71. illus.
  282. ———. 1913. Spraying for the velvet bean caterpillar. Fla. Agr. Exp. Sta. Press Bull. 216. 2 p.
  283. ———. 1913. Spraying for the velvet bean caterpillar. Fla. Grower 10:8.
  284. ———. 1913/1914. The use of sprays against the caterpillar of velvet beans. Fla. Agr. Exp. Sta. Annu. Rep. 1913/1914:50-52. illus.
  285. ———. 1914/1915. The velvet bean caterpillar. (*Anticarsia gemmatilis*). Fla. Agr. Exp. Sta. Annu. Rep. 1914/1915:49-64. illus.
  286. ———. 1915. Another migratory moth (Lep.). Entomol. News 26(9):419-422.
  287. ———. 1915/1916. Control of the velvet bean caterpillar. Fla. Dep. Agr. Bien. Rep. 14(2):183-193. illus.
  288. ———. 1915/1916. Velvet bean caterpillar (*Anticarsia gemmatilis*). Fla. Agr. Exp. Sta. Annu. Rep. 1915/1916:51R.
  289. ———. 1916. Control of the velvet bean caterpillar. Fla. Agr. Exp. Sta. Bull. 130:45-58. illus.
  290. ———. 1916. Control of the velvet bean caterpillar. Fla. Dep. Agr. Quart. Bull. 26(3):69-80. illus.
  291. ———. 1916. Life-history of the velvet-bean caterpillar (*Anticarsia gemmatilis* Hübner). J. Econ. Entomol. 9(6):521-528. illus. maps.
  292. ———. 1916. The velvet bean caterpillar and its control. Fla. Grower 13(5):11-12. illus.

293. ———. 1916/1917. Velvet-bean caterpillar (*Anticarsia gemmatilis*). Fla. Agr. Exp. Sta. Annu. Rep. 1916/1917:52R-53R.
294. ———. 1917/1918. The velvet-bean caterpillar (*Anticarsia gemmatilis*). Fla. Agr. Exp. Sta. Annu. Rep. 1917/1918:56R.
295. ———. 1918. Method of controlling velvet bean caterpillars. Fla. Grower 18(12):15.
296. ———. 1918/1919. Velvet bean caterpillar (*Anticarsia gemmatilis*). Fla. Agr. Exp. Sta. Annu. Rep. 1918/1919:51R-53R. illus.
- #297. ———. 1919/1920. The velvet bean caterpillar and the winter weather. Fla. Agr. Exp. Sta. Annu. Rep. 1919/1920:21R-23R.
298. ———. 1920/1921. The velvet-bean caterpillar. Fla. Agr. Exp. Sta. Annu. Rep. 1920/1921:30R-31R.
299. ———. 1921. The velvet bean caterpillar. Fla. Agr. Exp. Sta. Press Bull. 325. 2 p.
300. ———. 1921/1922. Farm crop insect work. Fla. Agr. Exp. Sta. Annu. Rep. 1921/1922:57R.
301. ———. 1922. Bunch velvet beans to control root-knot. Fla. Agr. Exp. Sta. Bull. 163:53-59. illus.
302. ———. 1922/1923. Insects of farm crops. Fla. Agr. Exp. Sta. Annu. Rep. 1922/1923:110R-111R.
303. ———. 1925/1926. The velvet bean caterpillar. (*Anticarsia gemmatilis*). Fla. Agr. Exp. Sta. Annu. Rep. 1925/1926:45R.
304. ———. 1928/1929. Life history studies and control of the velvet bean caterpillar. Fla. Agr. Exp. Sta. Annu. Rep. 1928/1929:53.
305. ———. 1929/1930. Velvet bean insects. Fla. Agr. Exp. Sta. Annu. Rep. 1929/1930:67.
306. ———. 1932. Further notes on the velvet bean caterpillar. Fla. Entomol. 16(2):24.
307. ———. 1932. Insects of the winter, 1931-32. Fla. Entomol. 15(4):71-73. illus.
308. ———. 1942. Insect conditions in Florida in 1941. Citrus Ind. 23(2):6, 14.
309. ———. 1943. Peanut insects and other enemies. Fla. Agr. Exp. Sta. Press Bull. 585. 4 p. illus.
310. ———. 1946. Control of summer crop insects. Fla. Grower 55[54](9):15, 18.
311. WHEELER, W. A. 1950. Forage and pasture crops. D. Van Nostrand Company, Inc., New York. 752 p. illus. refs.
312. WILLE, J. E. 1931/1932. Informe que presenta el Jefe de la Sección de Entomología, Dr. Johannes Wille, sobre la visita de inspección que ha practicado en el Valle de Tambo desde el 25 de noviembre al 7 de diciembre de 1931. [Report of the Head of the Section of Entomology, Dr. Johannes Wille, on a visit of inspection to the Tambo Valley, 25th November to 7th December 1931.] Mem. Soc. Nac. Agr. Lima 1931/1932:177-181.
313. ———. 1934. Der Zuckerrohrschädling *Anacetrinus saccharidis* Barber (Coleopt. Curcul.). Seine Massenvermehrung und die anderer Schädlinge in Peru in den Jahren 1930 bis 1931. (Beiträge zur Schädlingsfauna von Peru. VIII.). [The sugar-cane pest, *Anacetrinus saccharidis*. Its mass-increase and that of other pests in Peru in 1930 to 1931. (Contributions to the pest fauna of Peru. VIII.). Der Tropenpflanzer 37(5-6):185-198, 233-252. illus. refs.
314. ———. 1939. Departamento de Entomología. Memoria del Jefe del Departamento. [Department of Entomology. Memoir of the Chief of the Department.] La Molina Estac. Exp. Agr. Mem. 12:177-210 illus.
315. ———. 1941. Servicio especializado de entomología. [Specialized service of entomology.] La Molina Estac. Exp. Agr. Mem. 14:189-231. illus.
316. ———. 1943. Entomología agrícola del Perú. [Agricultural entomology of Peru.] Ministerio de Agricultura (Imprenta Americana), Lima, Peru. 36 p. illus. refs.
317. ———, and G. GARCIA RADA. 1942. Los insectos y las enfermedades del lino. [Insects and diseases of flax.] La Molina Estac. Exp. Agr. Informe 54. 19 p. illus.
318. ———, A. PEREZ ALCÁZAR, and G. JOHANSON G. 1947. Informe sobre los resultados obtenidos en la temporada de 1946-47 en el control de los insectos de la alfalfa por medio del insecticida DDT. [Report on the results obtained in the season of 1946-47 in the control of insects attacking alfalfa with the insecticide DDT.] La Molina Estac. Exp. Agr. Informe 66. 16 p. illus.
319. WILSON, C., and F. S. ARANT. 1949. Control of insects and diseases of peanuts. Ala. Agr. Exp. Sta. Inform. 27. 4 p.
320. WILSON, R. N. 1916. The velvet bean caterpillar. J. Econ. Entomol. 9(6):570.
321. WOLCOTT, G. N. 1923. "Insectae Portoricensis." A preliminary annotated checklist of the insects of Porto Rico, with descriptions of some new species. J. Dep. Agr. P. R. 7(1):5-313. refs.
322. ———. 1933. An economic entomology of the West Indies. The Entomological Society of Puerto Rico, San Juan, 688 p. illus. refs.
323. ———. 1936. "Insectae Boriniquenses." A revision of "Insectae Portoricensis," a preliminary annotated check-list of the insects of Porto Rico, with descriptions of some new species, and "First supplement to Insectae Portoricensis." J. Agr. Univ. P. R. 20(1):1-627. illus. refs.
324. ———. 1948. The insects of Puerto Rico. J. Agr. Univ. P. R. 32(1,2,3,4):1-975. illus. refs.
325. ———. 1955. Experiences with entomogenous fungi in Puerto Rico. P. R. Agr. Exp. Sta. Bull. 130. 19 p. illus. refs.
326. ———, and L. F. MARTORELL. 1940. Epidemics of fungus disease control insect pests in Puerto Rico. J. Econ. Entomol. 33(1):201-202. refs.
327. YOUNG, H. C. 1944. DDT against the white-fringed beetle and the velvet bean caterpillar. J. Econ. Entomol. 37(1):145-147. illus.

TABLE OF REFERENCES BY SUBJECT AND PERIOD OF PUBLICATION

| YEAR<br>SUBJECT                                 | 1816-<br>1899                                                                                               | 1900-<br>1909     | 1910's                                                                                           | 1920's                                            | 1930's                                                                                                   | 1940's                                                                                                                                                                                                                           | 1950's                                                                                                                            | 1960's                                                                                                                            | 1970's                                                                                     | SOYBEAN                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ECONOMY                                         | 58,59,60,76,<br>118,119,120,<br>121,123,124,<br>126,127,146,<br>147,178,179,<br>180,238,239,<br>240,276,277 | 77,84,<br>144,241 | 33,108                                                                                           | 321                                               | 131,159,160,<br>323                                                                                      | 238                                                                                                                                                                                                                              | 43,68,100,<br>109,250                                                                                                             | 151                                                                                                                               | 216,251                                                                                    | 131,151,159,216,228,250,251                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| DISTRIBUTION                                    | 118,127,178,<br>179,180,240,<br>276                                                                         | 77,84,<br>144     | 117,258,283,<br>286,287,289,<br>290,291                                                          | 5,156                                             | 74,115,130,<br>211                                                                                       | 173,228                                                                                                                                                                                                                          | 43,68,109,<br>160,171,250,<br>272                                                                                                 | 62,172,195                                                                                                                        | 218                                                                                        | 5,74,115,130,160,171,172,195,218,<br>228,250,272                                                                                                                                                                                                                                                                                                                                                                                                            |
| HISTORY &<br>GEOLOGY                            | 122                                                                                                         | 231               | 117,232,283,<br>286,287,289,<br>290,291,292,<br>294,296                                          | 5,7,55,<br>73,133,<br>209,298,<br>299,302,<br>304 | 74,90,131,<br>138,142,149,<br>176,210,211,<br>247,306,307,<br>313                                        | 91,167,173,177,<br>183,186,202,205,<br>213,308                                                                                                                                                                                   | 28,34,43,<br>171,182,187,<br>189,203,250,<br>266,267,268,<br>272                                                                  | 16,72,111,<br>143,172,188,<br>189,190,195,<br>206,234                                                                             | 67,113,116,<br>191,196,217,<br>218,236,251                                                 | 5,7,16,28,34,72,73,74,90,91,<br>113,116,131,138,142,143,149,157,<br>171,172,176,177,182,183,186,187,<br>188,189,190,191,195,196,198,202,<br>203,205,217,218,234,236,247,250,<br>251,266,267,268,272                                                                                                                                                                                                                                                         |
| ECOLOGY                                         |                                                                                                             |                   |                                                                                                  |                                                   |                                                                                                          |                                                                                                                                                                                                                                  |                                                                                                                                   |                                                                                                                                   | 116,174,236,<br>245,260                                                                    | 116,174,236,245,260                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| PHYSIOLOGY &<br>PSYCHOLOGY                      | 122                                                                                                         |                   | 291                                                                                              |                                                   |                                                                                                          | 205                                                                                                                                                                                                                              | 28                                                                                                                                | 206                                                                                                                               | 67                                                                                         | 28,205                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| ECONOMIC<br>ROLE<br>DAMAGE                      |                                                                                                             | 63,231            | 1,2,4,31,70,<br>232,243,258,<br>280,287,289,<br>290,320                                          | 6,7,47,<br>55,192,<br>194,209,<br>303             | 45,53,69,74,<br>83,96,138,<br>140,142,176,<br>210,211,225,<br>247,314                                    | 8,9,20,21,82,<br>131,167,177,183,<br>186,212,213,214,<br>224,315,316,317                                                                                                                                                         | 11,28,34,41,<br>129,187,215,<br>311                                                                                               | 17,36,39,40,<br>49,51,101,<br>143,154,157,<br>181,188,189,<br>190,234,261                                                         | 50,52,107,<br>165,191,196,<br>217,245,255,<br>264                                          | 6,7,8,9,11,17,20,21,28,34,<br>39,40,41,45,47,49,50,53,54,69,<br>74,82,85,96,101,107,134,138,140,<br>142,143,154,165,167,176,177,181,<br>183,186,187,188,189,190,191,194,<br>196,212,214,215,217,218,234,245,<br>247,255,261,264,303,311                                                                                                                                                                                                                     |
| PLANT<br>HOST<br>FEEDING<br>BEHAVIOR            | 277                                                                                                         |                   | 117,284,285,<br>287,289,290,<br>291,292,293                                                      | 6,194,<br>300,321                                 | 43,69,74,96,<br>130,138,139,<br>142,159,162,<br>176,220,247,<br>306,322,323                              | 8,91,128,135,<br>161,167,168,173,<br>177,183,186,202,<br>205,228,229,230,<br>249,318,324                                                                                                                                         | 28,43,64,68,<br>160,171,182,<br>193,198,203,<br>227,250,266,<br>267,268,272,<br>311                                               | 72,114,143,<br>151,157,172,<br>234,235                                                                                            | 216,251,256,<br>260                                                                        | 6,8,28,45,69,72,74,91,96,114,<br>128,130,135,138,139,142,143,151,<br>159,160,161,162,167,168,171,172,<br>176,177,182,183,186,194,198,202,<br>203,205,216,227,228,230,234,235,<br>247,250,251,256,260,266,267,268,<br>272,311,324                                                                                                                                                                                                                            |
| CHEMICAL<br>CONTROL                             |                                                                                                             | 231               | 2,3,29,65,<br>66,70,232,<br>243,258,281,<br>282,283,284,<br>285,287,289,<br>290,292,293,<br>295  | 7,73,<br>194,209,<br>299,301,<br>304              | 22,74,85,90,<br>94,95,96,<br>115,138,139,<br>142,149,162,<br>163,184,176,<br>210,211,226,<br>279,312,322 | 8,9,23,24,25,26,<br>27,37,46,48,56,<br>78,79,80,81,82,<br>83,86,87,88,89,<br>91,97,98,99,106,<br>128,132,145,152,<br>153,161,167,168,<br>170,177,183,186,<br>197,202,213,219,<br>220,224,237,239,<br>309,310,318,319,<br>324,327 | 10,11,12,14,<br>28,34,38,64,<br>40,72,103,<br>171,182,187,<br>154,172,175,<br>198,203,227,<br>266,267,268,<br>271,275,278,<br>311 | 15,16,36,39,<br>40,72,103,<br>104,143,150,<br>154,172,175,<br>188,189,190,<br>207,208,222,<br>223,242,252,<br>262,269,270,<br>274 | 19,107,110,<br>113,155,165,<br>191,196,199,<br>217,221,233,<br>246,248,253,<br>254,263,265 | 7,8,9,10,11,12,14,15,16,19,<br>26,28,34,37,39,40,56,72,73,74,<br>78,79,80,81,82,83,85,86,87,88,<br>89,90,91,94,95,96,97,103,104,<br>107,110,113,115,128,138,139,142,<br>143,149,150,153,154,155,161,162,<br>168,167,168,171,172,175,176,177,<br>182,183,186,187,188,189,190,191,<br>194,196,197,198,199,202,203,207,<br>208,217,221,222,223,227,233,237,<br>242,246,248,253,254,260,265,268,<br>265,266,267,268,269,270,271,274,<br>275,278,279,309,311,324 |
| LOGICAL<br>CULTURAL<br>&<br>CHEMICAL<br>CONTROL |                                                                                                             | 63                | 1,29,281,<br>282,283,284,<br>285,287,288,<br>289,290,292,<br>295,296,320                         | 298,299,<br>302,304,<br>305                       | 51,74,96,<br>141,162,226                                                                                 | 91,105,161,173,<br>183,186,309,326                                                                                                                                                                                               | 267,268,325                                                                                                                       | 61,188,189,<br>190                                                                                                                | 158,165,185,<br>191,246,263                                                                | 51,74,91,96,141,161,162,165,183,<br>185,186,188,189,190,191,246,263,<br>267,268,309                                                                                                                                                                                                                                                                                                                                                                         |
| PLASTICS<br>FACTORS<br>DISEASES                 |                                                                                                             | 231               | 30,71,76,<br>282,287,281,<br>282,283,284,<br>285,286,287,<br>288,289,290,<br>291,293,296,<br>320 | 6,194,<br>204,300                                 | 32,35,74,96,<br>115,138,139,<br>141,142                                                                  | 78,91,105,183,<br>186,212,308,309,<br>324,326                                                                                                                                                                                    | 28,100,125,<br>138,204,201,<br>244,267,268,<br>272,325                                                                            | 61,143,235                                                                                                                        | 18,57,107,<br>181,185,216,<br>293                                                          | 6,18,28,32,57,74,78,91,96,107,<br>115,138,139,141,142,143,153,184,<br>185,186,194,212,235,246,263,267,<br>268,272,309,324                                                                                                                                                                                                                                                                                                                                   |
| ECOLOGY                                         |                                                                                                             |                   |                                                                                                  |                                                   | 93                                                                                                       | 92                                                                                                                                                                                                                               |                                                                                                                                   |                                                                                                                                   |                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

## PERIODICAL ABBREVIATIONS

- Abh. Senckenberg. Naturforsch. Ges.—Abhandlungen der Senckenbergischen naturforschenden Gesellschaft.
- Agr. News (Barbados)—The Agricultural News (Barbados).
- Agr. Pecuar.—Agricultura e Pecuaria (Rio de Janeiro).
- Agron. Trop. (Maracay)—Agronomía Tropical (Maracay).
- Ala. Agr. Exp. Sta. Annu. Rep.—Alabama Agricultural Experiment Station Annual Report.
- Ala. Agr. Exp. Sta. Leaflet.—Alabama Agricultural Experiment Station Leaflet.
- Ala. Agr. Exp. Sta. Progr. Rep. Ser.—Alabama Agricultural Experiment Station Progress Report Series.
- Ala. Polytech. Inst. Grad. Sch. Bull.—Alabama Polytechnic Institute, Graduate School Bulletin.
- An. Reun. Fitosanit. Brasil—Anais da Reuniao Fitossanitaristas do Brasil.
- An. Soc. Espan. Hist. Natur.—Anales de la Sociedad Espanola de Historia Natural.
- Annu. Rev. Entomol.—Annual Review of Entomology.
- Arch. Inst. Biol. (São Paulo)—Archivos do Instituto Biológico (São Paulo).
- Ark. Agr. Exp. Sta. Ext. Serv. Circ.—Arkansas Agricultural Experiment Station Extension Service Circular.
- Ark. Agr. Exp. Sta. Rep. Ser.—Arkansas Agricultural Experiment Station Report Series.
- Auburn Univ. Coop. Ext. Serv. Circ.—Auburn University Cooperative Extension Service Circular.
- Barbados Dep. Agr. Rep.—Report on the Department of Agriculture, Barbados.
- Better Homes Gard.—Better Homes and Gardens.
- Biol. Cent.-Amer.—Biología Central-Americana.
- Bol. Campo (Rio de Janeiro)—Boletim do Campo (Rio de Janeiro).
- Bol. Didatico Esc. Super. Agr.—"Luiz de Queiroz" Univ. São Paulo—Boletim Didatico, Escola Superior de Agricultura "Luiz de Queiroz" Universidade de São Paulo.
- Boll. Lab. Entomol. Agr. "Filippo Silvestri"—Bollettino del Laboratorio di Entomologia Agraria "Filippo Silvestri."
- Bull. Amer. Mus. Natur. Hist.—Bulletin of the American Museum of Natural History.
- Bull. Brooklyn Entomol. Soc.—Bulletin of the Brooklyn Entomological Society.
- Bull. Buffalo Soc. Natur. Sci.—Bulletin of the Buffalo Society of Natural Sciences.
- Bull. Entomol. Res.—Bulletin of Entomological Research.
- Bull. U.S. Nat. Mus.—Bulletin of the United States National Museum.
- Bur. Farmer—Bureau Farmer (Louisiana Edition).
- Can. Entomol.—Canadian Entomologist.
- Caribbean Res. Coun., Crop Inq. Ser.—Caribbean Research Council, Crop Inquiry Series.
- Citrus Ind.—Citrus Industry.
- Clemson Agr. Coll. Ext. Serv. Circ.—Clemson Agricultural College Extension Service Circular.
- Clemson Agr. Coll. Ext. Serv. Inform. Card.—Clemson Agricultural College Extension Service Information Card.
- Clemson Univ. Agr. Ext. Serv. Circ.—Clemson University Agricultural Extension Service Circular.
- Clemson Univ. Agr. Res.—Clemson University Agricultural Research.
- Cornell Univ. Agr. Exp. Sta. Mem.—Cornell University Agricultural Experiment Station Memoir.
- Correio Agro-Pecuar. (São Paulo)—Correio Agro-Pecuario (São Paulo).
- Corresp. Bl. Zool.-Miner. Ver. Regensburg—Correspondenz-Blatt des Zoologisch-Mineralogischen Vereins in Regensburg.
- Entomol. Ber. (Amsterdam)—Entomologische Berichten (Amsterdam).
- Entomol. News—Entomological News.
- Entomol. Rec. J. Var.—The Entomologist's Record & Journal of Variation.
- Environ. Entomol.—Environmental Entomology.
- Ext. Serv. Rev.—Extension Service Review.
- Farm Quart.—Farm Quarterly.
- Farm Tech.—Farm Technology.
- Fdn. M. Lillo Univ. Nac. Tucuman Misc.—Fundacion M. Lillo, Universidad Nacional de Tucuman, Argentina, Miscelanea.
- FIR (São Paulo)—Fertilizantes, Inseticidas e Racoes (São Paulo).
- Fla. Agr. Exp. Sta. Annu. Rep.—Florida Agricultural Experiment Station Annual Report.
- Fla. Agr. Exp. Sta. Bull.—Florida Agricultural Experiment Station Bulletin.
- Fla. Agr. Exp. Sta. Press Bull.—Florida Agricultural Experiment Station Press Bulletin.
- Fla. Coop. Ext. Serv. Plant Prot. Pointers Ext. Entomol. Mimeo.—Florida Cooperative Extension Service, Plant Protection Pointers, Extension Entomology Mimeograph.
- Fla. Dep. Agr. Bien. Rep.—Florida Department of Agriculture Biennial Report.
- Fla. Dep. Agr. Bull. (n.s.)—Florida Department of Agriculture Bulletin, New Series.
- Fla. Dep. Agr. Quart. Bull.—Florida Department of Agriculture Quarterly Bulletin.
- Fla. Entomol.—Florida Entomologist.
- Fla. Grower—The Florida Grower.
- Fla. State Plant Bd. Quart. Bull.—Florida State Plant Board Quarterly Bulletin.
- Ga. Agr. Exp. Stas. Mimeo Ser.—Georgia Agricultural Experiment Stations Mimeo Series.
- Ga. Coastal Plain Exp. Sta. Bull.—Georgia Coastal Plain Experiment Station Bulletin.
- Ga. Coastal Plain Exp. Sta. Mimeo. Pap.—Georgia Coastal Plain Experiment Station Mimeograph Paper.
- Ga. Exp. Sta. Annu. Rep.—Georgia Experiment Station Annual Report.
- Ga. Exp. Sta. Press Bull.—Georgia Experiment Station Press Bulletin.
- Highlights Agr. Res.—Highlights of Agricultural Research.
- J. Agr. Univ. P. R.—Journal of Agriculture of the University of Puerto Rico.
- J. Amer. Soc. Agron.—Journal of the American Society of Agronomy.
- J. Dep. Agr. P. R.—Journal of the Department of Agriculture of Porto Rico.
- J. Econ. Entomol.—Journal of Economic Entomology.
- J. N. Y. Entomol. Soc.—Journal of the New York Entomological Society.
- La. Agr. Exp. Sta. Annu. Rep.—Louisiana Agricultural Experiment Station Annual Report.
- La. Agr. Exp. Sta. Bull.—Louisiana Agricultural Experiment Station Bulletin.
- La. Coop. Ext. Serv. Publ.—Louisiana Cooperative Extension Service Publication.
- La. Molina Estac. Exp. Agr. Informe—La Molina, Peru Estacion Experimental Agricola Informe.
- La. Molina Estac. Exp. Agr. Mem.—La Molina, Peru, Estacion Experimental Agricola Memoria.
- Mem. S. Calif. Acad. Sci.—Memoirs of the Southern California Academy of Sciences.
- Mem. Soc. Nac. Agr. Lima—Memoria de la Sociedad Nacional Agraria, Lima.
- Mex. Inst. Nac. Invest. Agr. SAG. Circ. CIANO—Mexico Instituto Nacional de Investigaciones Agricolas, Secretariat de Agricultura y Ganaderia, Centro de Investigaciones Agricolas del Noroeste Circular.
- Minas Gerais Brasil Dep. Prod. Veg. Bol. Agr.—Minas Gerais, Brasil, Departamento de Produção Vegetal, Boletim de Agricultura.
- Min. Agr. (Rio de Janeiro) S.I.A.—Ministério da Agricultura (Rio de Janeiro), Serviço de Informação Agrícola.
- Miss. Farm Res.—Mississippi Farm Research.
- Miss. State Univ. Coop. Ext. Serv. Inform. Sheet—Mississippi

- State University Cooperative Extension Service Information Sheet.
- Mo. Agr. Exp. Sta. Res. Bull.—Missouri Agricultural Experiment Station Research Bulletin.
- Montserrat Bot. Sta. Rep.—Montserrat. Report on the Botanic Station.
- N. Amer. Entomol.—North American Entomologist.
- N. C. Agr. Exp. Sta. Annu. Rep.—North Carolina Agricultural Experiment Station Annual Report.
- N. C. State Univ. Agr. Ext. Serv. Insect Notes, Grains & Soybeans Note—North Carolina State University Agricultural Extension Service Insect Notes, Grains and Soybeans Note.
- Okl. Agr. Exp. Sta. Bien. Rep.—Oklahoma Agricultural Experiment Station Biennial Report.
- Okl. Agr. Exp. Sta. Mimeo. Circ.—Oklahoma Agricultural Experiment Station Mimeographed Circular.
- Okl. Agr. Exp. Sta. Rep.—Oklahoma Agricultural Experiment Station Report.
- P.R. Agr. Exp. Sta. Bull.—Puerto Rico Agricultural Experiment Station Bulletin.
- P. R. Fed. Exp. Sta. (Mayaguez) Circ.—Puerto Rico Federal Experiment Station (Mayaguez) Circular.
- P. R. Fed. Exp. Sta. (Mayaguez) Rep.—Report of the Federal Experiment Station in Puerto Rico (Mayaguez).
- Pointe-a-Pitre Guadeloupe Sta. Agr. Rapp.—Pointe-a-Pitre, Guadeloupe, Station Agronomique Rapport.
- Proc. Assoc. S. Agr. Workers—Proceedings of the Association of Southern Agricultural Workers.
- Proc. Cotton States Br. Amer. Assoc. Econ. Entomol.—Proceedings of the Cotton States Branch, American Association of Economic Entomologists.
- Proc. La. Acad. Sci.—Proceedings of the Louisiana Academy of Sciences.
- Proc. N. Cent. Br. Entomol. Soc. Amer.—Proceedings of the North Central Branch, Entomological Society of America.
- Proc. Soil Crop Sci. Soc. Fla.—Proceedings of the Soil and Crop Science Society of Florida.
- Proc. Tall Timbers Conf. Ecol. Anim. Contr. Habitat Manage.—Proceedings of the Tall Timbers Conference on Ecological Animal Control by Habitat Management.
- Proc. 10th Int. Congr. Entomol. (Montreal)—Proceedings of the Tenth International Congress of Entomology (Montreal).
- Proc. Zool. Soc. London—Proceedings of the Zoological Society of London.
- Res. Farming (N. C. Agr. Exp. Sta.)—Research and Farming (North Carolina Agricultural Experiment Station).
- Rev. Comerc. Trabajo (Cuba)—Revista de Agricultura, Comercio y Trabajo (Cuba).
- Rev. Agr. P. R.—Revista de Agricultura de Puerto Rico.
- Rev. Asoc. Ing. Agronom.—Revista de la Asociación de Ingenieros Agrónomos.
- Rev. Ceres.—Revista Ceres.
- Rev. Chilena Entomol.—Revista Chilena de Entomología.
- Rev. Entomol. (Rio de Janeiro)—Revista de Entomologia (Rio de Janeiro).
- Rev. Fac. Agron. Univ. Repub. Uruguay—Revista de la Facultad de Agronomía, Universidad de la República, Uruguay.
- Rev. Fac. Agron. Vet. Univ. Rio Grande do Sul—Revista de Faculdade de Agronomia e Veterinária da Universidade do Rio Grande do Sul, Brasil.
- Rev. Fitotec. Latinoamer.—Revista Fitotecnica Latinoamericana.
- Rev. Ind. Agr. Tucuman—Revista Industrial y Agrícola de Tucuman.
- Rev. Inst. Bolsa Cereales—Revista Institucional de la Bolsa de Cereales.
- Rev. Peru. Entomol.—Revista Peruana de Entomología.
- Rice J.—Rice Journal.
- Santiago de las Vegas Cuba Estac. Exp. Agron. Circ.—Santiago de las Vegas, Cuba, Estacion Experimental Agronomica Circular.
- Santiago de las Vegas Cuba Estac. Exp. Agron. Informe—Santiago de las Vegas, Cuba, Estacion Experimental Agronomica Informe.
- Secr. Est. Neg. Agr. Ind. Comerc. S.I.P.A. (Ser. A)—Secretaria de Estado dos Negócios da Agricultura, Indústria e Comércio, Seção de Informações e Propaganda Agrícola (Serie A), Porto Alegre, Rio Grande do Sul, Brasil.
- Soil Sci. Soc. Amer. Proc.—Soil Science Society of America Proceedings.
- Solo Cent. Acad. "Luiz de Queiroz" Univ. São Paulo—Solo, Centro Academico "Luiz de Queiroz" Universidade de São Paulo, Brasil.
- Soybean Dig.—Soybean Digest.
- Sugar Bull.—The Sugar Bulletin.
- Tenn. Agr. Exp. Sta. Bull.—Tennessee Agricultural Experiment Station Bulletin.
- Tenn. Agr. Exp. Sta. Ext. Serv. Publ.—Tennessee Agricultural Experiment Station Extension Service Publication.
- Trans. Brit. Mycol. Soc.—Transactions of the British Mycological Society.
- Trans. Entomol. Soc. London—Transactions of the Entomological Society of London.
- Trop. Agr. (Trinidad)—Tropical Agriculture (Trinidad).
- Tucuman Estac. Exp. Agr. Publ. Misc.—Tucuman, Argentina, Estacion Experimental Agricola Publicacion Miscelanea.
- U.S. Dep. Agr. Agr. Handb.—United States Department of Agriculture, Agriculture Handbook.
- U.S. Dep. Agr. Agr. Res. Serv. Rep. State Agr. Exp. Stas.—United States Department of Agriculture, Agricultural Research Service, Report on the State Agricultural Experiment Stations.
- U.S. Dep. Agr. Bur. Entomol. Bull.—United States Department of Agriculture, Bureau of Entomology Bulletin.
- U.S. Dep. Agr. Bur. Entomol. Plant Quar. E Ser.—United States Department of Agriculture, Bureau of Entomology and Plant Quarantine, E Series.
- U.S. Dep. Agr. Farmers Bull.—United States Department of Agriculture Farmers' Bulletin.
- U.S. Dep. Agr. Leaflet.—United States Department of Agriculture Leaflet.
- U.S. Dep. Agr. Off. Exp. Stas. Rep.—United States Department of Agriculture, Report of the Office of Experiment Stations.
- U.S. Dep. Agr. Rep. Chf. Bur. Entomol. Plant Quar.—United States Department of Agriculture, Report of the Chief of the Bureau of Entomology and Plant Quarantine.
- U.S. Dep. Agr. Tech. Bull.—United States Department of Agriculture Technical Bulletin.
- U.S. Dep. Agr. Yearb. Agr.—United States Department of Agriculture, Yearbook of Agriculture.
- Univ. Buenos Aires Fac. Agron. Vet. Publ. In.—Universidad de Buenos Aires Facultad de Agronomía y Veterinaria Publicacion Interna.
- Univ. Ga. Coop. Ext. Serv. Leaflet.—University of Georgia Cooperative Extension Service Leaflet.
- Uruguay Min. Agr. Gan. Centro Invest. Sanid. Veg. Publ. Tec. (Ser. Zool. Agr.)—Uruguay Ministerio de Agricultura y Ganadería, Centro de Investigaciones de Sanidad Vegetal, Publicacion tecnica (Serie Zoología y Agricultura).
- Va. Polytech. Inst. Agr. Ext. Serv. Circ.—Virginia Polytechnic Institute Agricultural Extension Service Circular.
- Va. Polytech. Inst. Ext. Div. Contr. Ser.—Virginia Polytechnic Institute Extension Division Control Series.
- Verh. K. K. Zool.-Bot. Ges. Wien—Verhandlungen der kaiserlich-königlichen zoologisch-botanischen Gesellschaft in Wien.
- West Indian Bull.—West Indian Bulletin.
- West Indies Imp. Dep. Agr. Pamph. Ser.—Imperial Department of Agriculture for the West Indies, Pamphlet Series.









